THE ESSENTIAL SCHOOL HEALTH SERVICES PROGRAM DATA REPORT

2003 – 2004 School Year

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Introduction

In recent years, four major changes have dramatically affected school health services: (1) changes in family structure and patterns of parental employment; (2) the impact of diverse cultural and linguistic groups; (3) an increase in the number and severity of illness in students with special health care needs who are enrolled in schools; and (4) a rise in social morbidities such as substance abuse, depression, and violence among children.

These changes have resulted in an increased demand for health services in schools:

- With more working parents, children who are sick with mild or chronic conditions are less likely to be monitored at home on school days and more likely to be sent to the school nurse for assessment and a determination as to whether they need to see a physician (Thurber et al., 1991; Uphold & Graham, 1993; U.S. Census Bureau, 2000; Wold, 2001).

- Some "newcomer" groups rely on the school as a source of information about what services or providers are available in the community. They may not know how to obtain care elsewhere because of language or cultural barriers and, therefore, may look to the school health service for assistance.

- Improved medical technology has enhanced the health of children and adolescents with a variety of conditions and diseases previously associated with short life expectancy, e.g. cystic fibrosis, childhood leukemia, diabetes, juvenile rheumatoid arthritis and kidney disease. In addition, children assisted with medical technology, e.g. catheterizations, tracheostomies, ventilators, etc., are now attending school. Social attitudes that promote inclusion, as well as state and national laws related to disability rights and access to education, have resulted in more children requiring nursing care and other health-related services during the school day (Palfrey et al., 1992; Small et al., 1995).

- Students spend a large part of their day at school; therefore, the school can be an important site where health and education risks, e.g. depression, absenteeism, substance use, may be identified and timely interventions initiated. This can result in increased demands for professional health services in the schools (Thurber et al., 1991).

- The rapid restructuring of the health care delivery system has dramatically impacted school health service programs. With reduced hospitalizations and/or reduced lengths of stay, school nurses are now often responsible for supervising the care of children who have illnesses like acute asthma and diabetes that were formerly managed in a hospital setting (Chabra et al., 2000; Leslie et al., 1998; Schutte et al., 1997).

The Massachusetts Department of Public Health (MDPH) recognizes the need for quality school health services and provides consultation to all of the Commonwealth's school districts. Since 1993, the Department of Public Health has extended to a number of school systems the

opportunity to expand on the basic school health services model by establishing the Essential School Health Service Program (ESHS).

The goals of the Essential School Health Service model are to:

(1) provide high quality school health services to all children within the community;
(2) support the educational process;
(3) link the school health service programs to all aspects of the health care delivery system that serves children and their families.

In 1993, thirty-six school districts were funded for three and half years to: (a) strengthen the infrastructure of school health services in the area of personnel and policy development, programming, and interdisciplinary collaboration; (b) incorporate health education programs, including tobacco prevention and cessation programs, into the existing school health programs; and (c) develop linkages between school health service programs and community health care providers.

In October 1997, the Department funded 19 school districts under the Essential model (Essential School Health Services, ESHS) and 8 school districts with experience in developing the Essential model to provide consultation to approximately 42 additional school districts ("recipient schools") across the Commonwealth (Essential School Health Services with Consultation, ESHSC). These recipient school districts were interested in developing similar school health service programs.

In November, 1999, the Massachusetts legislature allocated additional funding to the Essential School Health Service Programs (ESHS and ESHSC). School systems for both models were selected for participation through a competitive bid process based on a Request for Response (RFR) developed by MDPH. As a result of 1999 RFR process, a total of 77 school districts (or affiliated school systems)[1] received awards in 2000: 11 Essential School Health Services with Consultation and 66 basic Essential Programs (see **Appendix A**). An added component of the 1999 RFR was that each applicant public school district was required to provide some elements of basic school health services (vision/hearing screening, immunization review, etc.) to all non-public and charter schools within the community (77 award recipients in 2000 served 253 non-public and charter schools)[2]. An additional 32 school districts received awards in 2001; all of these were basic Essential Programs (Sheetz, 2003).

In February 2003, midyear budget reductions eliminated most funding for the ESHS programs for the remainder of the fiscal year. Because of this, three programs decided to withdraw from the ESHS grant, thus reducing the number to 106 school districts in the Spring of 2003. Three more schools withdrew from the grant in 2004, leaving 103 districts in the ESHS program. The staff of the School Health Unit, Division of Primary Care and Health Access in the MDPH Bureau of Family and Community Health administer the programs.

[1] ESHS funding was awarded to local public school systems, regional academic school systems, independent vocational systems, vocational-technical regional systems, and school unions.
[2] 223 non-public schools, 30 charter schools.

Executive Summary

The information collected by the Essential School Health Services Program provides a valuable snapshot of school nursing practice in a diverse, but non-representative cohort of Massachusetts public schools. The data reveal that school nurses perform a wide array of duties -- direct care, health education, administrative case management, and policy/program development and oversight -- on behalf of students whose health needs range from routine to serious and complex.

Analysis of the ESHS program data for the school year beginning September, 2003 and ending June, 2004 showed the following:

- 103 ESHS school districts reported a total of 6,556,385 student health encounters.
- In a typical district, students visited the school nurse an average of 1.2 times per month.[3] There was substantial variability among school districts, with the encounter rate ranging from 0.5 to 3.7 visits per month.
- After assessment and/or treatment by a school nurse, the majority (88.7%) of the students visiting the nurse's office with an illness or injury complaint were returned to the classroom to continue their studies.
- 10.2% of the more serious injuries to students were classified as intentional. These include injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).
- School nurses in the 103 districts referred students to emergency health services a total of 11,940 times.
- The majority (84.3%) of the prescriptions managed by the school nurse were for medications dispensed on an as-needed (PRN) basis.
    - Among students taking as-needed (PRN) medications, asthma medications were the most common (30.2 prescriptions per 1,000 enrolled students).
    - Among students on daily prescription medications, psychotropic medications were by far the most common (7.3 per 1,000 enrolled students).
- In the 103 ESHS districts, school nurses administered an average of 99,051 doses of prescription medication to students per month. A little over half of these were doses of psychotropic (mostly psychostimulant) medications.
- Each full-time school nurse (or equivalent) performed an average of 48.7 procedures per month.
    - Blood glucose testing was the most common procedure (38.8 procedures per 1,000 students each month).
- Tobacco prevention and cessation programs reached substantial numbers of individuals, although activity levels varied widely across districts.
    - 4,039 students participated in individual tobacco cessation counseling, while a roughly equal number, 4,174, participated in group cessation counseling. Adults were considerably more likely to receive individual

[3] "Typical" is defined in this report as the median district. It is the district lying in the middle of the group, with half the districts having higher values and half having lower values.

cessation counseling than group cessation counseling, at 604 and 177, respectively.

- 26,057 students participated in group tobacco prevention activities.

Continued refinements in data collection and analysis will more accurately capture school nursing and school health activity, improve our ability to monitor the health needs and status of the school age population, and identify areas for improvements in services and quality of care. Identifying trends in school health encounters and student health indicators may assist school nursing staff in improving the delivery of prevention, education, and intervention services to the school community. Future data collection efforts will seek to increase our knowledge of health needs in the school setting and in the school age population, explore the relationship between student health status and educational outcomes, and investigate ways in which health services and prevention activities in schools can help children live healthier lives.

Findings

School Nurse Staffing Patterns

Staffing patterns were available for 103 of the 103 ESHS/ESHSC districts whose data contributed to this report. The equivalent of **1,317 full-time school nurses** served a total of **551,184 students,** thereby averaging **418 students per nurse**, during the 2003-2004 school year.[4] The funding sources for these nurses were as follows:

- **211 (16%)** were funded by the MDPH Essential School Health Services Program.
- **1,106 (84%)** were funded through local school budgets and other sources.

School Health Services Activity

The primary goal of the Essential School Health Services Program is to improve the delivery of health services to students by reinforcing the school health service infrastructure. Toward that end, program participants were required to report throughout the year the type and scope of school nursing activity in their districts. These activities were divided into nine categories of data:

1) **Health encounters**
2) **Injury reports, early dismissals, and referrals for emergency health services**
3) **Medication management**
4) **Screenings**
5) **Medical procedures**
6) **Linkages**
7) **Oral health**
8) **Tobacco, health education, and support groups**
9) **Nursing case management**

Data collection methods, analytical procedures, and technical notes are discussed in **Appendix C**.

1. Health Encounters

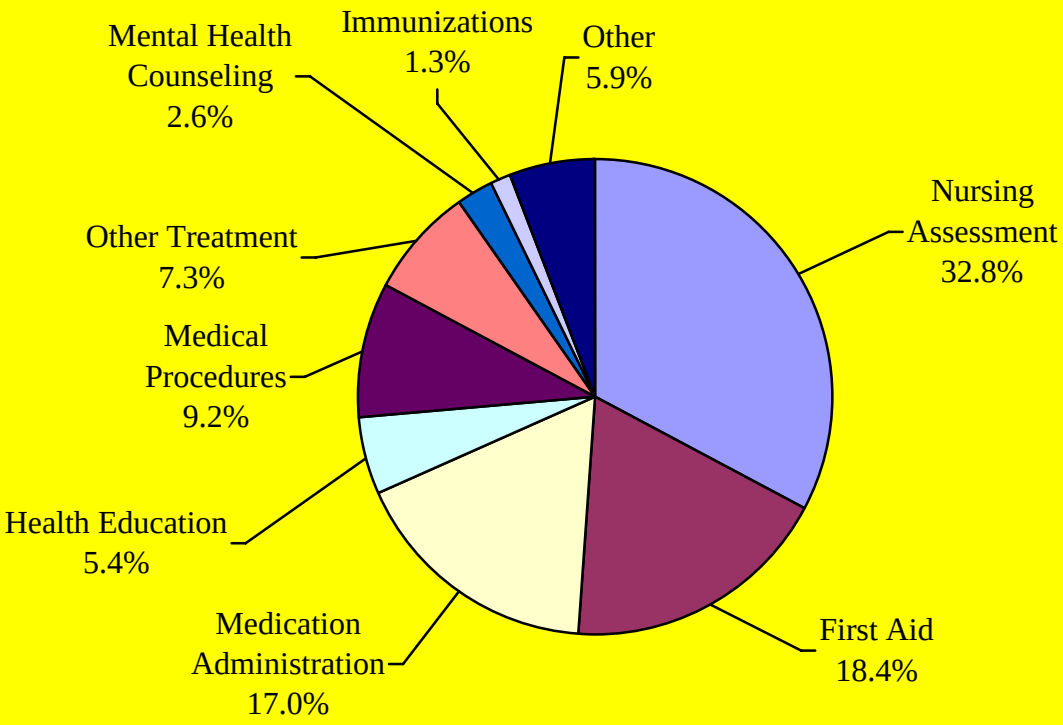
Each month, districts reported the total number of student health encounters. An "encounter" was defined as *any contact with a student during which the school nurse provided counseling, treatment, or aid of any kind*. Casual conversations fall outside this definition and were not counted. In addition, mandatory screenings were not counted as encounters because these are routine population-based activities. Screenings were tracked separately, however.

[4] These statistics include data from the ESHSC *lead* districts, but do not include data from the ESHSC *recipient* districts. The count of "School Nurses" includes only Registered Nurses (RNs) and nurse leaders, but excludes other health support staff which may have been funded by the ESHS contract.

Between September 1, 2003 and June 30, 2004, 103 school districts reported a combined total of **6,556,385 student health encounters**. The number of encounters reported per district varied widely, with individual districts averaging between 227.8 and 63,896.7 encounters per month. These differences were largely due to district size. In a typical district**, each student visited the school nurse an average of 1.2 times per month**, although the encounter rate varied across the 103 districts from 0.5 to 3.7 visits per month. While some students are seen several times each month, many others are never seen. The school nurse workload, measured by the number of encounters a full time nurse logs each month, varied greatly across the districts, with the rate in the typical district being **515.0 encounters per month**[5]

"Nursing assessment," "first aid," and "medication administration" were the most common primary reasons for visits to the school nurse (Figure 1).

FIGURE 1. Types of Student Health Encounters (By Primary Presenting Issue) September 1, 2003 - June 30, 2004 (n=103 districts)



"Nursing Assessment" includes assessment, triage, and reassessment of illness by nurses.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

[5] For these calculations, "school nurses" includes only RNs and nurse leaders.

In some encounters, students reported more than one type of health complaint. In the 103 districts providing data, **1,229,858** secondary complaints were reported. Whereas "individual health education" and "mental health counseling" accounted for a relatively small proportion of the "primary" reasons for student health encounters, these issues were more likely to be uncovered when measuring "secondary" reasons for health encounters (Table 1).

Health services were also provided to school staff (i.e., teachers and administrators). School nurses in 103 districts reported a total of **165,242** staff health encounters. Across the 103 districts, monthly averages ranged from **6.8** to **2,156.4** staff health encounters per month.

TABLE 1. Number and Percentage of Student and Staff Health Encounters September 1, 2003 - June 30, 2004 (n=103 districts)

	Students			
	Primary Issue		**Secondary Issue**	
	Number	**Percent**	**Number**	**Percent**
Nursing Assessment*	2,153,711	32.4 %	162,768	13.2 %
First Aid	1,206,080	18.1	119,398	9.7
Medication Administration	1,115,974	16.8	129,486	10.5
Health Education	355,934	5.4	553,642	45.0
Medical Procedures	602,868	9.1	65,289	5.3
Other Treatment	478,102	7.2	38,466	3.1
Mental Health Counseling	171,143	2.6	91,878	7.5
Immunizations	86,144	1.3	1,150	0.1
Other	478,102	7.2	67,781	5.5
TOTAL	6,648,058	100.0 %	1,229,858	100.0 %

*"Nursing Assessment" includes assessment, triage, and reassessment of illness by nurses.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

2. Injury Reports, Early Dismissals and Referrals for Emergency Health Services

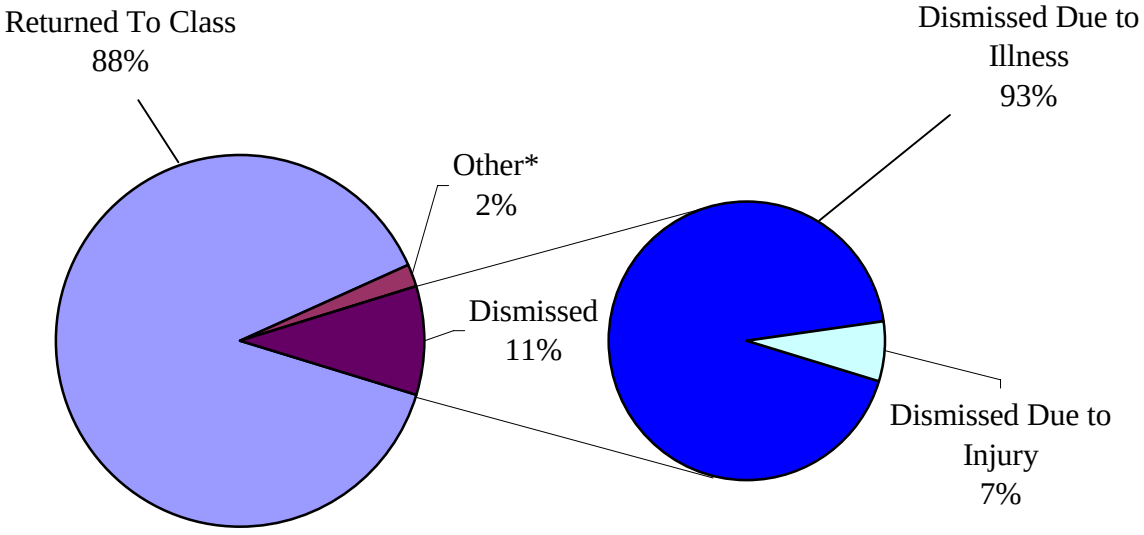
An important function of school nursing practice is to provide on-site health services to students who are sick, injured, or experiencing a serious health emergency. Each month, districts tallied the number of on-campus injury reports, early dismissals due to illness, and referrals for emergency health services. After assessment and/or treatment by a school nurse, the majority **(88.7%)** of students visiting the nurse's office with an illness or injury complaint were returned to the classroom to continue their studies (Table 2 and Figure 2). These on-site services provide major benefits. Students who are treated on-site can be returned to the classroom with minimal interruption of their educational activities; working parents do not have to take time off from work to provide care; and the high cost of treatment in a doctor's office is avoided.

TABLE 2. Disposition After Illness/Injury Assessment September 1, 2003 - June 30, 2004 (n=103 districts)				
	Number		Percent	
Returned to Class	3,212,165		88.7%	
Dismissal			9.4%	
Due to Illness		*316,958*		*93.0%*
Due to Injury		*23,833*		*7.0%*
Total Dismissals	340,791	*340,791*		*100.0%*
Other*	69,385		1.9%	
Total	3,622,341		100.0%	

* Includes "Stayed in health office" and "Referred to counselor's office".
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

When students had to be dismissed, it was usually the result of illness (93%) rather than injury (7%).

FIGURE 2. Disposition After Nursing Assessment
September 1, 2003 - June 30, 2004 (n=103 districts)



Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

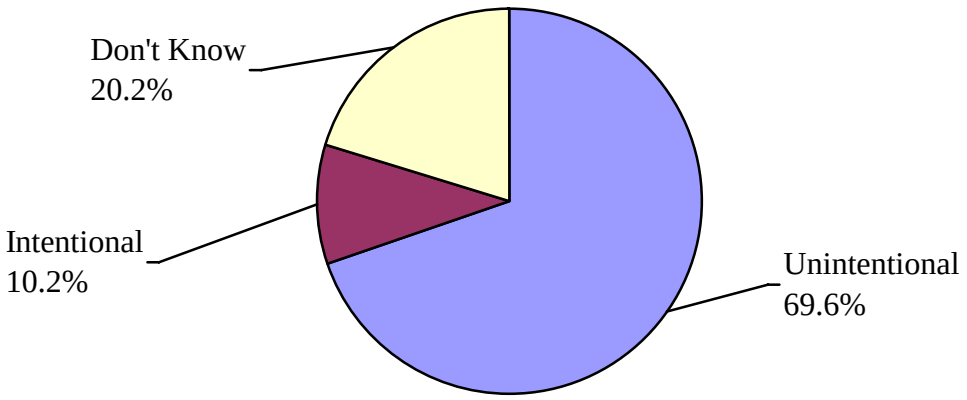
For injuries of a more serious nature, school nurses filed *injury reports* according to state and local policy. For the 2003-2004 School Year, districts reported a total of **46,637** student injury reports and **3,145** staff injury reports (Table 3):

TABLE 3. Number of Student and Staff Injury Reports September 1, 2003 - June 30, 2004 (n=103 districts)		
	Number	**Percent**
Student		
Intentional	4,756	10.2 %
Unintentional	32,473	69.6
Unknown	9,408	20.2
Total Student	46,637	100.0 %
Staff		
Intentional	387	12.3 %
Unintentional	2,535	80.6
Unknown	223	7.1
Total Staff	3,145	100.0 %

Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

Of the student injury reports filed by school nurses, 10.2% involved the intentional infliction of injury (Figure 3). These include injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).

FIGURE 3. Student Injury Reports by Intent
September 1, 2003 - June 30, 2004 (n=103 districts)



Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.
Intentional: Includes injuries resulting from assaults (e.g. physical fighting) and those that were self-inflicted (e.g. intentional drug overdose, suicide attempts).

In addition, school nurses in the 103 districts referred students to *emergency health services* a total of **11,940** times**.**

- In **2,113 (17.7%)** of these events, 9-1-1 or ambulance services were called.
- In the remaining **9,827 (83.3%)** events, parents or others were called to transport the student to emergency health services.

3. Medication Management

In 1993, the Massachusetts Department of Public Health promulgated regulations governing the administration of medications in public and private schools. The purpose of these regulations (105 CMR 210.000) is to provide minimum safety standards for the administration of prescription medications to students during the school day.

The school nurse's role in managing the medication administration program for the district is broad in scope. In addition to developing district-wide medication policies in collaboration with the school committee, school administration, and school physician, the school nurse:

- administers medications to students (including monitoring students' response to medications);
- delegates the administration of selected medications to appropriately trained school staff (if the district is registered with the MDPH to do so);
- ensures the proper training and supervision of these designated staff; and
- establishes a formal record-keeping system for the district's medication administration program.

Implicit in the description of medication administration is the nurse's responsibility for the following: development of the medication administration plan; assessment of the child prior to administering each medication; and follow-up evaluation of medication efficacy and side effects.

ESHS districts tracked the number of *students* using prescription medications as well as the number of *prescriptions* that had been ordered for their students. During the reporting period, 103 districts reported a total of 35,576 students with at least one prescription for medication. In other words**, 65 out of every 1,000 enrolled students had prescriptions for medications.** There was substantial variability across districts, however, as the rate of students with prescriptions ranged from 8 to 441 per 1,000 students. Throughout the year, the total number of prescriptions reported to school nurses averaged 40,992 for the 103 districts (see table below). Note that because some students had more than one prescription, the number of prescriptions is larger than the number of students with prescriptions. Among prescriptions taken on a scheduled, daily basis, psychotropic medications were the most common, while among prescriptions taken on an "as-needed" (PRN) basis, asthma medications were the most common.[6]

[6] PRN is an abbreviation for "pro re nada," a Latin term meaning "as needed." PRN medications are not scheduled for set times, but given as needed. For example, an analgesic medication that is given whenever pain or discomfort occurs is considered a PRN medication.

TABLE 4. Number of Student Prescriptions by Type Reported to School Nurses (Monthly Average)
September 1, 2003 - June 30, 2004 (n=103 districts)

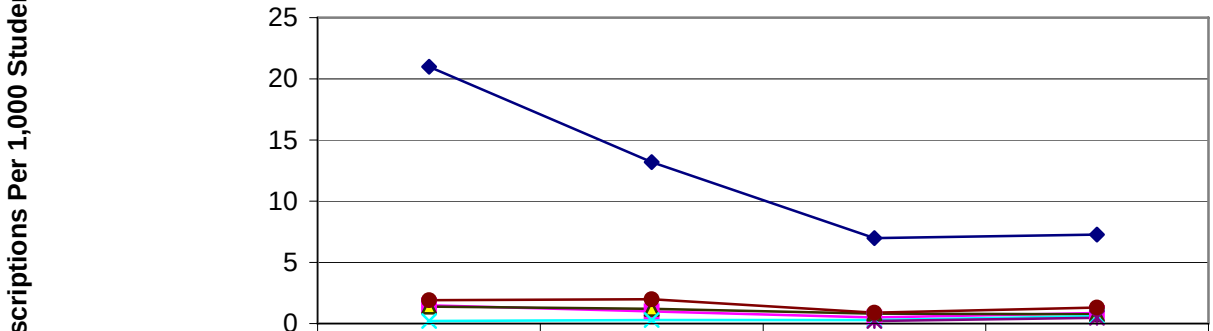
	Daily Medications (All Districts)	PRN Medications (All Districts)	Total (Daily & PRN) Medications
Analgesics	96.2	8,501.5	8,597.7
Antibiotics	424.4	105.3	529.7
Anticonvulsants	256.4	194.0	450.4
Antihypertensive	62.3	66.3	128.6
Asthma	478.6	16,651.7	17,130.3
Epinephrine	18.0	5,416.3	5,434.3
Insulin	336.4	669.6	1,006.0
Psychotropic*	4,017.0	760.5	4,777.5
Others	717.2	2,018.5	2,735.7
Total	6,406.5	34,383.7	40,790.2
Row Percent	15.7%	84.3%	100.0%

* "Psychotropic" includes psychostimulants. "PRN" refers to medications taken on an "as-needed" basis.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

These figures show the *at-school* prescription rates reported by the ESHS districts. The at-school prescription rate reflects the medications that are to be administered at school, during school hours, by the school nurse (or under the supervision of the school nurse). These rates *understate* the actual number of students taking prescription medications, however. There are two reasons for this. First, students who self-administer at school without the knowledge of the nurse are not counted in the nurse's data reports.[7] This type of "counting error" may disproportionately lower reported prescription rates for certain categories of students. Middle and high school students, for example, might be more likely to self-administer than elementary school students, and, therefore, would be less likely to be counted in the numbers reported by the school nurse. Second, medications taken only at home, as some types of *daily* medications are, are unlikely to be reported to school nurses. For example, the decrease in the at-school psychotropic prescription rate over the last few years (from 21.0 per 1,000 students in 2001, 13.2 in 2002, 7.0 in 2003, and 7.3 in 2004 may be due to the use of new one-dose slow-release psychostimulant drugs, which are administered at home and are not reported to school nurses. On the other hand, PRN medications (medications prescribed for administration on an 'as needed' basis) such as medications taken to treat asthma attacks or allergic reactions, are more likely to be reported to the school nurse because of the potential need for administration during the school day. As a result, prescription rates for these medications may be better estimates of the true overall prescription rate for the school age population.

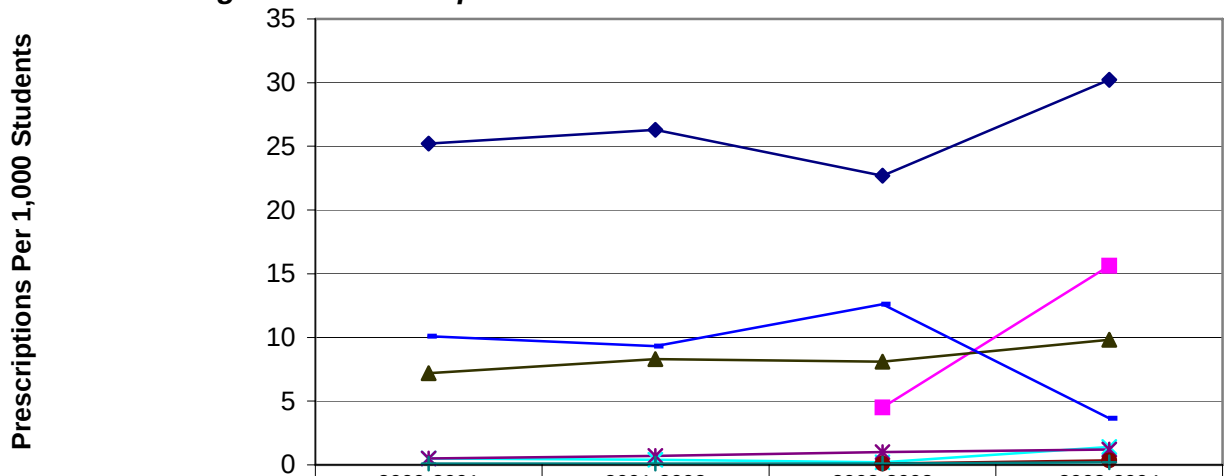
[7] Regulations require that students inform nurses about self-administered medications. If students do not comply with regulations, these medications may not come to the attention of school nurses.

*Figure 4a. Prescription Medication Rate for Daily Medications***



	2000-2001	2001-2002	2002-2003	2003-2004
Psychotropic*	21.0	13.2	7.0	7.3
Asthma Medications	1.5	1.0	0.5	0.9
Antibiotics	1.4	1.2	0.8	0.8
Insulin	0.2	0.3	0.3	0.6
Anticonvulsants			0.2	0.5
Others	1.9	2.0	0.9	1.3

*Figure 4b. Prescription Rate for As-Needed Medications***



	2000-2001	2001-2002	2002-2003	2003-2004
Asthma Medications	25.2	26.3	22.7	30.2
Analgesic			4.5	15.6
Epinephrine	7.2	8.3	8.1	9.8
Psychotropic*	0.5	0.4	0.2	1.4
Insulin	0.5	0.7	1.0	1.2
Anticonvulsants			0.1	0.4
Antibiotics	0.1	0.1	0.1	0.2
Others	10.1	9.3	12.6	3.7

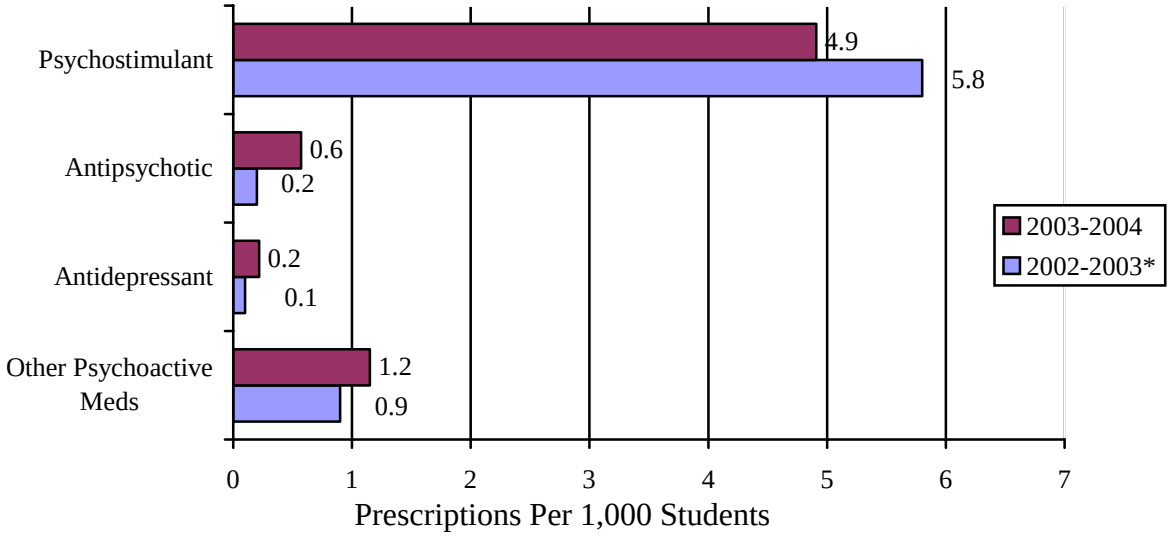
*"Psychotropic" includes psychostimulants.
** The 2002-2003 school year data only included only 4 out of 10 months of data. The 2000-2001 school year had 74 districts reporting as compared to 103 districts in 2003-2004.
Rates shown are those reported by the typical (median) district in the ESHS program.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program

School nurses tracked the number of prescriptions for several different types of psychotropic medications. Psychostimulants were the most commonly reported psychotropic medication (in both daily and PRN categories) during the school year (Table 5).

TABLE 5. Number of Student Psychotropic Prescriptions (Monthly Average) September 1, 2003 - June 30, 2004 (n=103 districts)

	Daily Medications	PRN Medications
Anti-anxiety	77.7	73.3
Anti-depressant	120.0	26.1
Anti-psychotic	314.4	63.7
Mood stabilizer	160.0	26.7
Psychostimulant	2,711.3	445.6
Other Psychoactive	633.6	125.5
Total	4,017.0	760.9
Row Percent	84.1%	15.9%

FIGURE 5. Psychotropic Prescription Medication Rate* (Per 1,000 Students) Daily Medications September 1, 2003 - June 30, 2004 (n=103 districts)



*Rates shown are those reported by the typical (median) district in the ESHS program. Psychostimulants include medications such as Ritalin that are used for treating Attention-Deficit/Hyperactivity Disorder, a condition characterized by high levels of inattention and / or hyperactivity.

**2002 – 2003 includes only 4 months of data.

PRN refers to medications taken on an "as-needed" basis.

Psychostimulants include medications such as Ritalin that are used for treating Attention-Deficit/Hyperactivity Disorder, a condition characterized by high levels of inattention and / or hyperactivity.

School nurses in the 103 ESHS districts administered an average of 131,288 doses of medication to students per month. Almost half of these were doses of psychotropic medications, followed by over-the-counter (OTC) medications and asthma medications (Table 6).

TABLE 6. Number of Medication Doses by Type Administered to Students by School Nurses* Per Month

Medication	Doses	Percent
Analgesic	4,145.9	3.2 %
Antibiotic	2170.9	1.7
Anticonvulsant	3,342.4	2.5
Antihypertensive	754.4	0.6
Asthma	15,570.7	11.9
Epinephrine	134.6	0.1
Insulin	6,888.5	5.2
Psychotropic**	56,188.9	42.8
Other	9,855.0	7.5
OTC Analgesic	26,295.7	20.0
Other OTC	5,941.0	4.5
Total	131,288.0	100.0 %

* Includes supervised self-administration
** "Psychotropics" includes psychostimulants such as Ritalin used for treating Attention-Deficit/Hyperactivity disorder.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

4. Health Screenings

Public schools in Massachusetts are required by law to conduct postural, hearing, and vision screening on all students.[8] Some school systems have also opted to conduct voluntary health screenings based on the particular health needs of their students. School nurses are responsible for ensuring that these screenings are completed and for referring students for follow-up care when needed. During the school year, school nurses at 103 districts conducted the following number of required and voluntary student health screenings. These numbers represent *initial* screenings, and do not include *re-screenings*:

[8] The law permits waivers of certain grades under certain circumstances. Postural screenings of students in grades 5 through 9 may not be waived, however.

*TABLE 7. Yearly Student Health Screenings September 1, 2003 - June 30, 2004 (n=103 districts)**				
	Screenings All Districts		% of Students Screened Median District	
Type of Screening	**2001-2002**	**2003-2004**	**2001-2002**	**2003-2004**
Vision	395,330	366,651	75.7%	68.8%
Hearing	359,807	340,934	74.1%	61.9%
Height/Weight	290,428	254,987	60.5%	51.0%
Postural	172,570	149,269	36.5%	32.5%
Dental	51,447	44,427	5.8%	2.9%
Nutritional	33,773	18,420	3.0%	1.1%

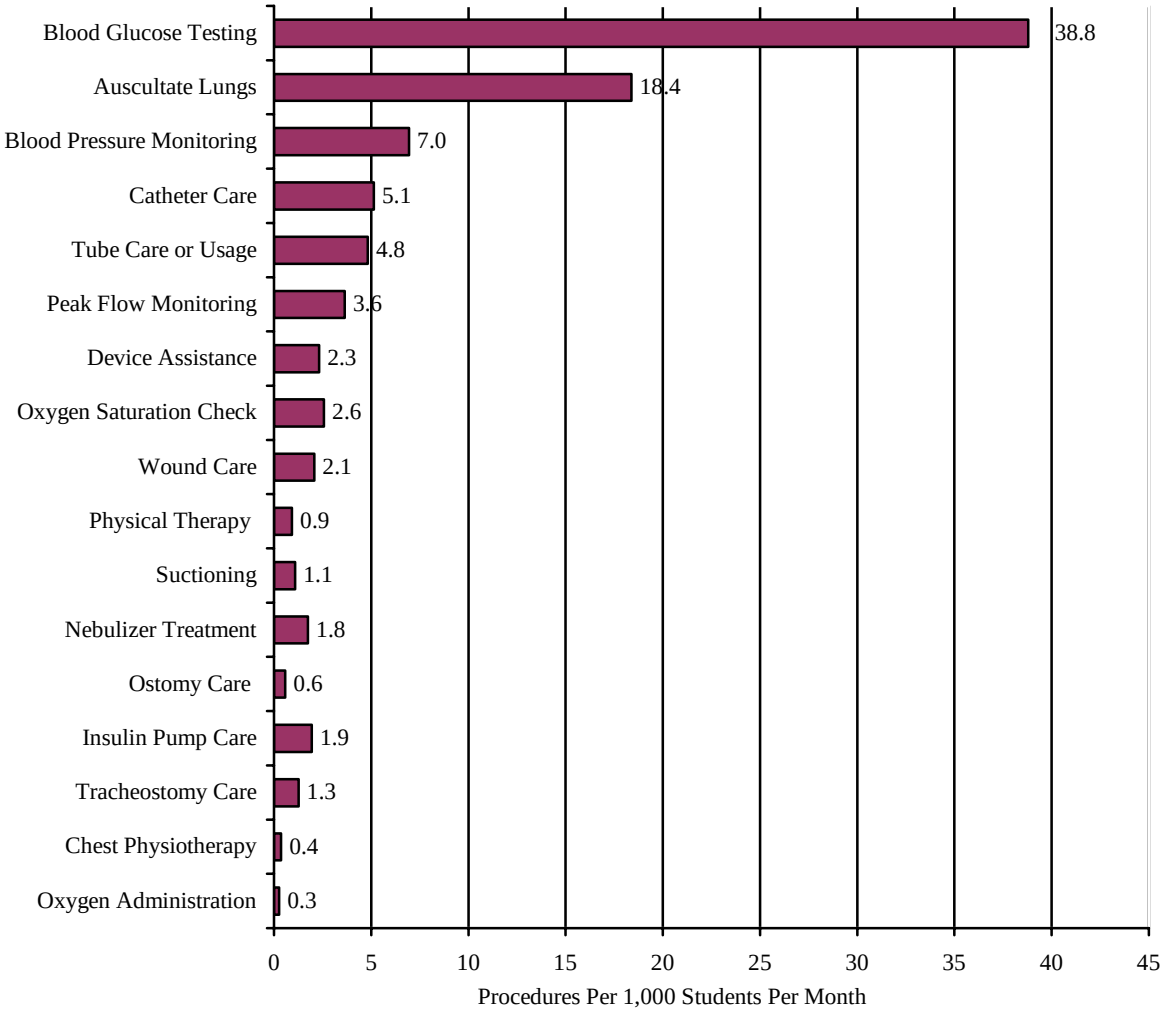
* In the comparison year, 2001-2002, n=110 districts. Medians exclude districts that did not track that type of screening.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

School nurses also performed pediculosis (head lice) screenings. For the 103 districts that performed these screenings each month, the average number of screenings per month, including initial screenings and re-screenings, totaled 23,755.5.

5. Medical Procedures

Enrollment of children assisted by medical technology in the public school system has increased in recent years. This phenomenon presents multiple challenges for school administrators, parents and guardians, school health services personnel, teachers, and students. ESHSP school districts collected information on the number and type of procedures performed by nurses that involved medical technology, as well as other medical procedures performed by school nurses. Consistent trends in the school health data may be associated with emergent public health issues. For example, the increase in Blood Glucose Testing over the past 4 years may be a consequence of the current obesity/diabetes epidemic. Monthly medical procedure rates per 1,000 enrolled students are shown in Figures 6a and 6b.

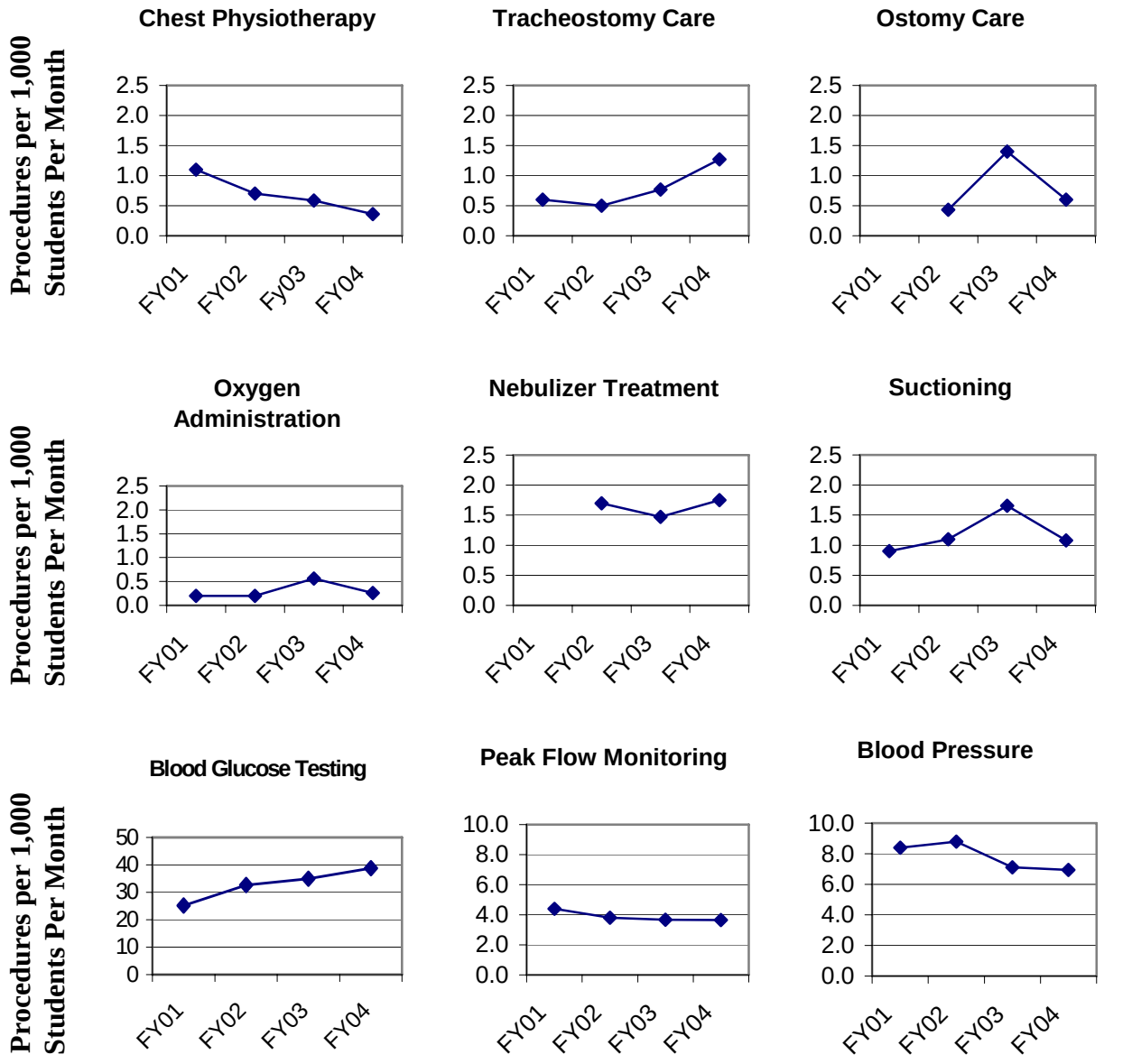
FIGURE 6a. Medical Procedure Rates
Sepember 1, 2003 - June 30, 2004 (n=103 districts)



Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

FIGURE 6b. Procedure Rates per 1000 Students per Month*

September 1, 2003 – June 30, 2004 (n=103 districts)

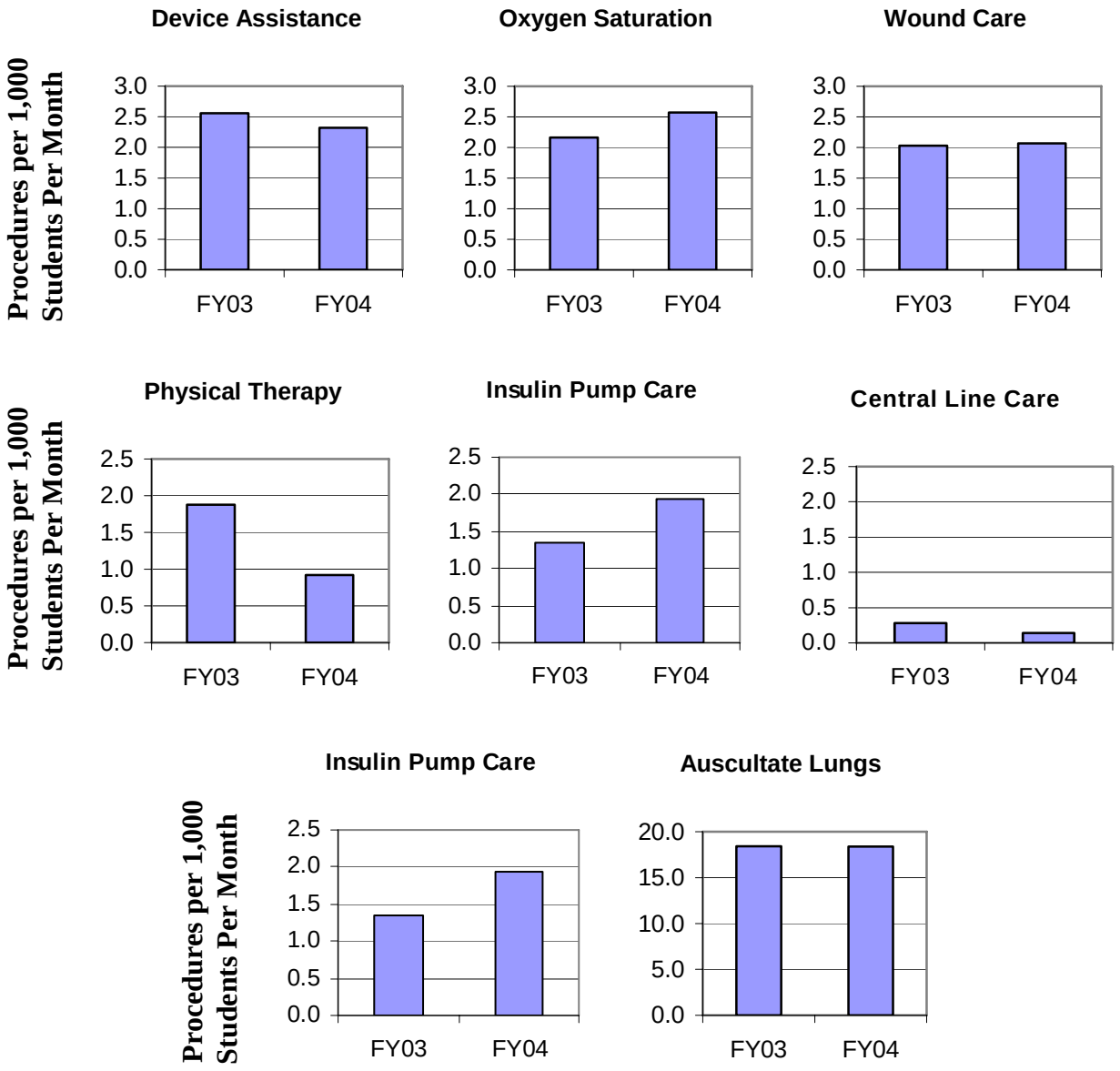


*Among those districts performing the procedure at least once.
Note that in 2002-2003, data was available for only 4 out of 10 months.

If there are no data points then data was not available for that year.
Rates shown are those reported by the typical (median) district in the ESHS program.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program

*FIGURE 6b. Procedure Rates per 1000 Students per Month**

September 1, 2003 – June 30, 2004 (n=103 districts)



*Among those districts performing the procedure at least once.
Note that in 2002-2003, data was available for only 4 out of 10 months.
Rates shown are those reported by the typical (median) district in the ESHS program.
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program

The median number of medical procedures per full-time nurse each month was **45** procedures. Medical procedure rates are summarized in Table 8:

TABLE 8. Medical Procedure Types and Totals
September 1, 2003 - June 30, 2004 (n=103 districts)

Type of Procedure	Number of Procedures Per Month (All Districts)	% of Districts Performing Procedure
Auscultate Lungs	15,038	100.0%
Blood Glucose Testing	20,539	99.0%
Blood Pressure Monitoring	5,040	100.0%
Catheter Care	2,318	59.2%
Central Line Care (a)	281	23.3%
Chest Physiotherapy	346	30.1%
Device Assistance	3,176	91.2%
Feeding Tube Care (b)	3,118	57.3%
Insulin Pump Care	1,680	71.8%
Nebulizer Treatment	1,604	95.1%
Ostomy Care (c)	332	29.1%
Oxygen Administration	278	29.1%
Oxygen Saturation Check	1,969	44.7%
Peak Flow Monitoring	4,486	92.2%
Physical Therapy	753	41.7%
Suctioning	297	20.4%
Tracheostomy Care	220	15.5%
Wound Care	2,826	91.2%
Total	64,302	

a) Central Line Care: Monitor infusion or administration, Pump monitoring, IV Bag Change, dressing change.
b) Naso-Gastric, Gastronomy or Other Feeding Tube Care or Usage
c) Ostomy Care- Colstomy/Ileostomy/Urostomy
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

6. Linkages

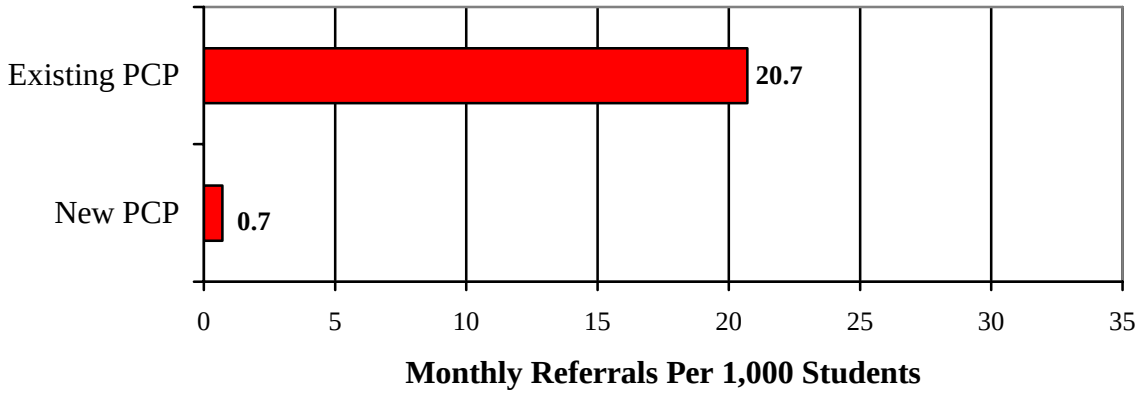
ESHS school systems identified students without primary care and, in consultation with their families, referred them to appropriate health care services. School systems also referred many students to their existing primary care providers. During the 2003-2004 school year, participating districts reported the following:

- **A total of 179,752 students requiring primary care services were identified and referred to primary care providers.** Those students without primary care providers were referred to new providers. Referrals included:

  - **12,324 referrals to new primary care providers, (6.9% of total primary care referrals.)** In a typical district, monthly referrals to new primary care providers averaged 21 students, a rate of 0.7 referrals per 1,000 enrolled students per month

  - **167,428 referrals to existing primary care providers (93.1% of total referrals).** In a typical district, monthly referrals to existing primary care providers averaged 673 students, a rate of 20.7 referrals per 1,000 enrolled students per month

FIGURE 7. Primary Care Provider Referrals
Median Monthly Rate Per 1,000 Students
September 1, 2003 - June 30, 2004 (n=103 districts)



Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

Each month, school nurses receive Massachusetts Asthma Action Plans (MAAPs) from health care providers.[9] These written plans provide individualized instructions for managing asthma episodes and administering asthma medications. During the school year, 103 districts reported receiving from providers MAAPs for **461.6 students** monthly. Individual districts received between **0.0 and 66.4 action plans per month**. School nurses reported a total of **34,194 students** with MAAPs on file at the end of the school year (with 97 districts reporting these totals).

[9] This section refers only to Standard Triplicate Form Massachusetts Asthma Action Plans.

7. Oral Health

School nurses are increasingly performing oral health related activities. Table 8 summarizes these activities for the 2003-2004 school year.

The typical district participating in oral health screening activities screened students at a rate of **3.0 per 1,000 students per month**.[10] There was considerable variability across districts, with the most active district performing **70.5** screenings per 1,000 students per month. School nurses played an active role in oral screenings; for every 10 students screened by a dentist or hygienist, **8.9** were screened by the school nurse (see table below).

TABLE 9. Summary of Oral Health Related Activities September 1, 2003 - June 30, 2004 (n=103 districts)

Oral Health Related Activity	% of Districts Performing Activity	Number of Students (Total)
Screened by School Nurse	58%	20,844
Screened by Dentist/Hygienist	48%	23,583
Third Grader Screenings	37%	6,553
Dental Sealant	31%	4,816
Flouride Rinse	59%	176,975
Referred to Dental Provider	65%	9,216

Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

8. Health Education, Tobacco Prevention and Support Groups

School nurses are often called upon to deliver health education in the classroom. In this teaching role they provide information to students on topics such as nutrition education, injury prevention, and human growth and development. Throughout the 2003-2004 school year, school nurses in the 103 districts delivered **13,207 classroom presentations** (in a typical district, each full-time school nurse delivered about 1 presentation per month).

In addition to classroom presentations, nurses in 103 districts provided individual assistance and counseling on nutritional issues to **9,602** students per month (in a typical district, **11** out of every 1,000 enrolled students received nutritional counseling per month).

During the school year, school nurses in ESHS districts provided the following tobacco prevention/cessation services:

[10] Rate is based on those districts that performed one or more oral health screening activities.

- A total of 1,694 tobacco group prevention meetings were held in 36 districts, in which attendance summed to 26,057 students and 929 adults.

- A total of 347 tobacco group cessation meetings were held in 20 districts, in which attendance summed to 4,174 students and 177 adults.

- A total of 4,039 individual tobacco cessation counseling sessions were delivered to students and 604 individual cessation counseling sessions were delivered to adults among 62 districts.

- In 32 of the districts, students were referred to other tobacco prevention/cessation services 463 times, and adults were referred to outside sources 141 times.

- During the 2002-2003 school year, the MDPH School Health Unit collaborated with the Department of Preventive and Behavioral Medicine, University of Massachusetts Medical School, in conducting a randomized controlled trial (RCT) to determine if school-nurse interventions could help individual students stop using tobacco. The study was implemented in 71 Massachusetts high schools. Because the preliminary results looked very promising, additional school nurses have been trained in the interventions through the University of Massachusetts/Simmons College School Health Institute.

Support Groups

Table 10 summarizes participation in student support group activities led or assisted by school nurses for the 2003-2004 school year. It does not include tobacco-related support groups which were discussed previously.

TABLE 10. Support Group Activities
September 1, 2003 - June 30, 2004 (n=103 districts)

Support Group Topic	% of Districts Offering Group	Total Number of Meetings	Total Number of Participants
Emotional Support (a)	50.5	1825	6,190
Nutrition	40.8	833	7,709
Food Allergy	34.9	194	1,852
Anger Mgmt (b)	31.0	620	10,128
Diabetes	32.0	302	1,297
Substance Abuse (c)	26.2	137	3,288
Asthma	22.3	363	1,860
Peer Leadership	18.5	412	2,738
GLBT (d)	19.4	257	1,188
Other	17.5	991	9,425

a) Emotional / Psychosocial Support
b) Anger / Conflict / Violence Management
c) Alcohol or Substance Abuse
d) Gay / Lesbian / Bisexual / Transgender
Source: *Monthly Activities Reports* submitted by districts in the Essential School Health Services program.

The support group most likely to be offered was "Emotional/Psychosocial Support" (offered by **50.5%** of districts); such groups also generated the greatest number of total meetings **1,825.** The support groups with the largest number of participants were the anger management groups, engaging over 10,000 participants. These groups were only available in 32 percent of districts, however.

9. Nursing Case Management

Data from the monthly activities report revealed that, beyond providing direct care to students, school nurses spent a significant portion of their day performing case management duties that included communication with families, other school staff, and community health care providers

about student health concerns. During the school year, school nurses from **103** districts conducted:

- a total of **905,024** health counseling and education encounters with parents (including phone calls, meetings, and conferences, but excluding home visits), with the typical district reporting **590.5** encounters per month (range: **30.6** to **8,673.3** encounters per month);

- a total of **3,033** home visits, with the typical district reporting **0.5** home visits per month (range: **0.0** to **45.8** home visits per month);

- a total of **385,354** phone calls, meetings, and conferences with other school staff about student health issues, with the typical district reporting **219.5** contacts per month (range: **0.0 to 4571.8** meetings per month);

- a total of **92,023** phone calls with other agencies and health providers about student health issues, with the typical district reporting **35.3** phone calls per month (range: **0.0 to 1132.9** phone calls per month).

The following chart shows case-management activity levels per school nurse FTE per month across the 103 participating districts:

TABLE 11. Nursing Case Management Activities: Student-Health Related Activities Per Month Per Nurse FTE September 1, 2003 - June 30, 2004

Type of Activity	Median (Per FTE)
Calls, meetings, & conferences with parents	66.8
Calls, meetings, & conferences with staff	24.9
Phone calls with agencies/providers	5.1
Home visits to families	0.05

For children with special health care needs, nursing case management involves the development of Individual Health Care Plans (IHCPs) designed to maximize their potential for learning. An IHCP, usually developed by the school nurse in conjunction with the student's family, the school physician, other school staff, and relevant community health care providers, is an individualized care plan that stipulates a student's specific medical, nursing, emergency care, and educational needs while in school during the school day. IHCPs are reviewed on a regular basis to ensure that students receive the appropriate health care they need during the school day.

During the 2003-2004 school year, 103 Enhanced sites reported:

- a total of **19,750** new IHCPs for the year, with the median district reporting **10.3** new IHCPs per month (range: **0.0 to 172.7** IHCPs per month);

- a median, per full-time school nurse, of **1.2** new IHCPs per month (range: **0.1 to 20.8** IHCPs per month);

- a total of **15,108.1** ongoing IHCPs per month, with the median district reporting **82.2** ongoing IHCPs per month (range: **1.5** to **1,553.3** IHCPs per month);

- a median rate, per full-time school nurse, of **10.1** ongoing IHCPs per month (range: **0.03 to 168.5** IHCPs per month).

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APPENDIX A

District Enrollment
Essential School Health Services Program Districts: 2003-2004

DISTRICT NAME	ADMINISTRATION	REGION	TYPE	STUDENTS
Amesbury	Town	NE	R	2,726
Amherst-Pelham	Regional Academic	W	R	3,926
Ashburnham-Westminster	Regional Academic	C	R	2,439
Ashland	Town	Metro West	R	2,590
Avon	Town	SE	R	702
Barnstable	Town	SE	R	5,586
Belchertown	Town	W	R	2,513
Berkshire Hills	Regional Academic	W	R	1,415
Boston	City	Boston	C	60,150
Bourne	Town	SE	R	2,532
Braintree	Town	Metro West	R	5,003
Bridgewater-Raynham	Regional Academic	SE	R	6,061
Brockton	City	SE	C	16,471
Brookline	Town	Boston	R	6,022
Cambridge	City	Metro West	R	6,437
Canton	Town	Metro West	R	3,006
Central Berkshire Regional (Dalton)	Regional Academic	W	C	2,286
Chelsea	City	Boston	C	5,678
Chicopee	City	W	R	7,528
Clinton	Town	C	R	2,020
Cohasset	Town	Metro West	R	1,444
Dedham	Town	Metro West	R	2,996
Douglas	Town	C	R	1,588
East Longmeadow	Town	W	C	2,748
Fairhaven	Town	SE	R	2,259
Fall River	City	SE	R	11,697
Foxborough	Town	Metro West	R	2,887
Framingham	Town	Metro West	C	8,102
Frontier	Regional Academic	W	R	1,705
Gardner	City	C	R	3,263
Gateway	Regional Academic	W	R	1,398
Georgetown	Town	NE	R	1,617
Gloucester	City	NE	R	4,019
Granby	Town	W	R	1,140
Hadley	Town	W	R	648

Appendix A continued

DISTRICT NAME	ADMINISTRATION	REGION	TYPE	STUDENTS
Hampden-Wilbraham	Regional Academic	W	R	3,852
Hanover	Town	SE	R	2,779
Harwich	Town	SE	R	1,524
Haverhill	City	NE	R	8,051
Holliston	Town	Metro West	R	3,120
Holyoke	City	W	R	7,245
Hudson	Town	Metro West	C	2,769
Lawrence	City	NE	C	12,508
Leominster	City	C	R	6,228
Lexington	Town	Metro West	R	6,175
Lowell	City	NE	R	15,117
Ludlow	Town	W	R	3,077
Lynn	City	NE	R	14,621
Malden	City	NE	R	6,135
Mansfield	Town	SE	R	4,742
Marblehead	Town	NE	R	3,016
Medford	City	NE	R	4,716
Melrose	City	NE	R	3,572
Milford	Town	C	R	4,185
Milton	Town	Metro West	R	3,580
MohawkTrail Regional (Buckland)*	Regional Academic	C	R	1,717
Mount Greylock School Union (Lanesborough)	Town	W	R	551
Nashoba	Regional Academic	C	R	3,063
Natick	Town	Metro West	R	4,604
Needham	Town	Metro West	R	4,722
New Bedford	City	SE	R	14,546
Newburyport	City	NE	R	2,381
Newton	City	Metro West	R	11,415
North Andover	Town	NE	R	4,359
North Attleborough	Town	SE	R	4,668
North Berkshire Union (Clarksburg)	City	W	R	377
Northampton	Voc. & Agricultural	W	R	2,978
Northampton Smith Voc. & Agricultural High	Town	W	R	444
Northboro-Southboro	Regional Academic	Metro West	R	4,781
Northbridge	Regional Academic	Metro West	R	2,550
Norwood	Town	Metro West	R	3,727
Palmer	Town	W	R	2,093

Appendix A continued

DISTRICT NAME	ADMINISTRATION	REGION	TYPE	STUDENTS
Pioneer Valley Regional (Northfield)	Regional Academic	W	R	1,092
Pittsfield	City	W	R	6,605
Plymouth	Town	SE	R	8,754
Provincetown	Town	SE	R	259
Quincy	City	Metro West	R	8,897
Randolph	Town	Metro West	R	3,815
Rockland	Town	SE	R	2,722
Rockport	Town	NE	R	1,024
Salem	City	NE	C	4,923
Sandwich	Town	SE	R	4,148
Shirley	Town	C	R	752
Somerville	City	Metro West	R	5,616
Southwick Tolland	Regional Academic	W	R	1,923
Springfield	City	W	C	26,132
Stoughton	Town	SE	R	4,070
Taunton	City	SE	R	8,396
Triton (Byfield)	Regional Academic	NE	R	3,551
Wachusett	Regional Academic	C	R	6,998
Walpole	Town	Metro West	R	3,629
Waltham	City	Metro West	R	4,667
Ware	Town	W	R	1,295
Watertown	Town	Metro West	R	2,394
West Bridgewater	Town	SE	R	1,022
Westborough	Town	Metro West	R	3,507
Westfield	City	W	R	6,574
Westford	Town	NE	R	5,112
Weston	Town	Metro West	R	2,370
Weymouth	Town	Metro West	R	6,895
Whitman-Hanson	Regional Academic	SE	R	4,456
Wilmington	Town	Metro West	R	3,792
Winthrop	Town	Boston	R	2,149
Worcester	City	C	R	25,055
TOTAL				551,184

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Notes:

1. "Type" refers to type of ESHS award: "R" means that the district is a part of the basic or regular ESHS program; "C" means that the district is a part of the ESHS With Consultation program.
2. "Region" refers to the six standard geographic regions defined by the Executive Office of Health and Human Services (EOHHS): "W" =Western, "C" = Central, "NE" = Northeastern, and "SE" = Southeastern. "Metro West" and "Boston" are self-explanatory.

APPENDIX B

Essential School Health Services Program

Minimum Deliverables

Infrastructure for the comprehensive School Health Program strengthened.

1. Quarterly meetings of School Health Advisory committee.
2. Implementation of school district and building emergency plan by Year 1.
3. 100% students requiring prescription medications during the day have medication administration plan by Year I.
4. Role of school health services in student support/intervention program established.
5. Minimum of 1 support group operational in addition to Tobacco by Year II.
6. Annual student health needs assessment conducted and analyzed.
7. A selected number of policies reviewed, revised and approved annually.
8. Position descriptions for school health personnel developed during Year I.
9. 100% of students with special health care needs have individualized health care plans by end of Year I.
10. Marketing brochure completed during Year II.

Comprehensive health education program, including tobacco prevention and cessation, strengthened.

1. Documentation of enforcement activities related to violation of the tobacco-free school policy yearly or enforcement plan for tobacco-free school policy implemented in Year I.
2. Completion of annual tobacco use assessment.
3. Establishment of target goal for reduction in tobacco use, Year II.
4. Documentation of coordinated planning with health education coordinator.
5. Participation in a local community-based coalition addressing child and adolescent health.

Students linked to primary care providers, other community health providers and community prevention programs, and referred to insurance plans if uninsured.

1. Design and implementation of on-going process for identifying primary care providers and health insurers (including HMOs) serving the current student population and referral mechanisms for children/families, Year I.
2. 90% of all students will have their primary care provider and insurance carrier identified by end of Year II.
3. 75% of all students identified as lacking a primary care provider will be referred to a provider within the first year, with incremental increases annually.
4. 100% of uninsured eligible children and adolescents referred to Children's Medical Security Plan (CMSP) or MassHealth for enrollment by end of Year I.

Management information system implemented.

1. 100% of the students' health records will be computerized by Year II.
2. Completed annual report on data specific to the program.

Development of quality improvement process with identification of projects to document the effectiveness and efficiency of the school health service program.

1. In relation to efficiency, work with BFCH to determine formula to calculate cost per encounter.
2. Identification of types of student encounters (health assessment, nursing care, nursing treatment, first aid, etc.) by end of Year I.
3. Develop one health status improvement measure such as % of six graders appropriately immunized, or decrease to less than 10% number of students who use tobacco, etc.

APPENDIX C

Data Collection Methods

Contractual obligations require districts in the ESHS and ESHSC programs to submit a monthly report to MDPH. This report, the ESHS **Monthly Activities Report**, provides a detailed, standardized summary of the health services activities that took place in the district during the prior month. It includes a count of the number of encounters, medications administered, medical procedures, and other types of services provided.

Information for these reports is gathered from each school nurse. In most districts, school nurses enter health encounter data into a computer database loaded on a computer located in the school health office. The database facilitates data reporting as well as helps the nurse maintain systematic records and schedule follow-ups.[11] Nurses are encouraged to enter information during or directly after a health encounter. Each district in the ESHS program selects its own database software. Across the program, ten or more different software products are used, although the majority of districts use one of two popular applications. Within a district, all school nurses usually use the same software product. The software products operate differently. Many districts use a networked database that links all schools to the same database and permits the data coordinator to run district-wide data reports, while other districts use stand-alone databases in which data reports must be run separately at each school before being compiled at the district level. Due to resource constraints, nurses in a few school districts maintain paper logs and manually tabulate the data. Although districts use different software applications and some districts tabulate data manually, all districts are required to tabulate their data the same way and to submit a standard data report to MDPH. In any event, information is gathered from each school nurse in the district, tabulated, and entered into the Monthly Activities Report form in summary (or aggregate) form.

In addition, districts in the ESHS and ESHSC programs submit **status reports** once a year. This report measures progress in meeting program objectives, and includes performance measures relating to health services infrastructure, MIS development, linkages to all aspects of the health delivery system, and quality evaluation. It also summarizes the number of health screenings performed and health surveys administered during the school year. The recipient school districts in the ESHSC program submit this report once a year.

Data from the monthly activities reports submitted by ESHS/ESHSC program districts during the 2003-2004 school year is the primary source of information for the statistics presented. Over the course of the 2003-2004 school year, monthly encounter data were collected successfully from 103 of the 103 ESHS award recipients that were required to submit data (100% of program total), serving a total of **551,184** (56% of the state public school enrollment total). For the 103 school systems that submitted data during the 2003-2004 school year, MDPH all of the 1030 expected monthly reports. For consistency, missing data from the monthly reports were filled with district averages.

[11] Paper logs are still used to record data elements that are not typically included in most school health software programs. For example, one item that is usually logged by hand is "Number of support group meetings."

For the 103 districts that form the basis of this report, the median student enrollment was 3,629, with a range of 259 to 60,150 students. This sample includes school districts from many areas of the state. It includes urban, suburban, and rural districts; city, town, regional, and vocational school systems; and large, medium, and small districts.

Data Analysis Methods

In order to reduce the potential for confusion, the statistical concepts and terms used in this report are described below.

For each measurement or "indicator," a ***district-level statistic*** is determined in each district by calculating a monthly average for the 4-month evaluation period. The **monthly average** for a particular district is calculated by adding the total number of events or encounters that occurred in a particular district during the evaluation period and dividing that total by the number of months included in that evaluation period. Because it is awkward to refer constantly to the "monthly average for the district" or the "district-based monthly average," these data are referred to as the **district average**. These two terms--the monthly average and district average--are used interchangeably in this report. All monthly averages in this report were calculated over the same ten-month period (September through June).

Wherever possible, standard units of analyses (*rates*) are used, as they facilitate both cross-district and historical comparisons, which can provide context and meaning to the statistics. The standard units of analysis that were used most frequently in this report are the monthly rate per 1,000 student health encounters, the monthly rate per 1,000 enrolled students, and the monthly rate per full-time equivalent (FTE) nurse. The **monthly rate per 1,000 student health encounters** is calculated by dividing the monthly average for that indicator by the total number of student health encounters in that district and multiplying the result by 1,000. Similarly, the **monthly rate per 1,000 enrolled students** is calculated by dividing the monthly average by the total number of enrolled students in that district and multiplying the result by 1,000. Rates per thousand enrolled students were calculated utilizing October 2003 student enrollment figures provided by the Massachusetts Department of Education (see Appendix A). Finally, the **monthly rate per full-time equivalent (FTE) nurse** is calculated by dividing the monthly average by the total number of Registered Nurse FTEs in that district. Sometimes the rate is not based on an average of *monthly* data but on aggregate data for the full year. For example, **the rate of health screenings per 1,000 students** is determined by dividing the total number of screenings *for the whole year* by the number of students enrolled and multiplying the result by 1,000.

Program-wide statistics describe not individual districts, but the ESHS/ESHSC program as a whole. In these calculations, each district represents a data point that is used in calculating summary statistics. For example, if averages are calculated for 100 districts, the result is a collection of 100 district averages that can be arrayed from lowest to highest along a frequency distribution. When frequency distributions are *skewed* (that is, the values tend to clump around either the lowest or highest value, rather than around the middle), the *median,* rather than the *average*, is used to measure central tendency. *Because most of the ESHS/ESHSC frequency distributions were skewed, the median is used throughout this report.* The **median** represents the

number above and below which exactly 50% of the districts fall. It is a better measure of central tendency than the *average* for skewed data, because the average tends to be more affected by extreme values. The most common use of median in this report is with district-based monthly averages; for a particular indicator, the median for the group of ESHS/ESHSC districts (a *program-level* statistic) is the district average (or monthly average) above and below which exactly 50% of the individual district averages fell. The **range** of a set of district averages refers to the lowest and highest values across the entire group of ESHS/ESHSC districts. The district with the median value for an indicator is sometimes referred to as the **median district** or the **typical district**. The median value across all the monthly district averages is also referred to as the **median district average**.

Medians can also be calculated for rates. For example, the **median Emergency Referral rate** (i.e., Emergency Referrals per 1,000 health encounters) is calculated by first putting the total number of Emergency Referrals in the form of a rate (for each district, dividing the total number of Emergency Referrals by the number of student health encounters and multiplying by 1,000), and then finding the median of these rates.

Data Limitations

This report focuses exclusively on the delivery of school health services by nursing staff. In addition, because project sites were not selected to serve as a representative sample of the Commonwealth, this summary is descriptive in nature and is not intended to be used to make generalized statements about health services in all Massachusetts public schools. Furthermore, caution should be exercised when comparing ESHS statistics across years. Each year the set of districts that report data changes to some degree, which creates somewhat different sample sets. For example, in the 2000-2001 school year, 74 districts reported data, whereas in the school year 2003-2004, 103 districts reported data. In addition, in years prior to 2001, the number of districts that reported data (approximately 25) was drastically lower than in more recent years (approximately 100). Due to this difference in data sets, comparisons to data from years prior to 2001 would be considerably less valid. Also, data has not always been available for all months of the school year. Most notably, in the 2002-2003 school year, only the months September through December were reported. This noted, after 2001 the core group of districts has been relatively stable, and the sample size is large enough such that comparisons are not without merit. Where statistical differences are large, and trends continue for several years, comparisons are more likely to be meaningful.

The descriptive data presented here also do not capture the dynamic and multi-faceted nature of health services delivery in a school system, which would require in-depth qualitative analysis of the program participants. Differences in data collection and data tabulation procedures may account for some of the variability observed across districts. Furthermore, a small percentage of the school districts in the program did not have computerized records of office visits and relied on paper logs and hand tallying of data by individual nurses. In these cases, it is impossible to control for factors such as data-entry errors at the district level, consistent misinterpretation of data elements, and numerical "guesstimates" provided by participants. Some of these data quality problems can lead to significant under- or over-counting. Finally, interpretation of the

data is limited because we have not attempted to analyze the influence of school district demographics or other participant differences.

Participating districts were required to implement, in a short period of time, both program innovations that entailed major organizational change and, in most cases, the development of an internal data collection system (see Appendix B). Therefore, this report represents a preliminary attempt to measure the health services activity in participating school systems. Improvements in data collection procedures, data collection tools, and data collection instructions and training occur on a continuing basis, leading to corresponding improvements in data validity and reliability.